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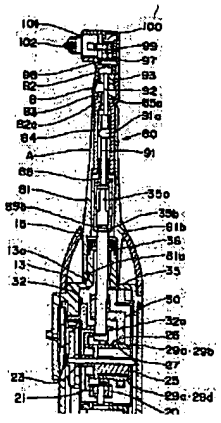
[19,1996. 3.27,04] (04,JP,Unexamined Utility Model Publication,1975120654)
Title of invention: An electrically operated toothbrush device
Abstract: [ABSTRACT]

A toothbrush hold is established in revolution liberty in a stab in face slanting toward a body mounting base as against those coupling direction, and that a toothpaste point exposes brush to backside and back tooth nadodeat of tooth, there surely and easily, and effect brushes its teeth is enabled.



(57) [Claims]

[Claim 1] An electrically powered toothbrush having a toothbrush unit mounted on the main body with the shaft of the latter coupled to the drive shaft of the former, the motor of the former being driven to move said drive shaft so that the motion thereof is transmitted via said shaft in order to move the toothbrush of the latter,

wherein said toothbrush unit comprises a main body mounting basal portion for mounting to said main body, and a toothbrush retaining portion for retaining said toothbrush;

said shaft being rotatably arranged within said main body mounting basal portion, and a flexible shaft for coupling said shaft with said toothbrush being rotatably arranged within said toothbrush retaining portion; and

said toothbrush retaining portion being attached in a rotatably adjustable manner to said main body mounting basal portion by means of interlocking therewith at a sloping face inclined with respect to the axis of the drive shaft.

TRANSLATION FROM JAPANESE

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(73) Assignee: 999999999RICOH ELEMEX

(72) Inventor: ITO Kazumasa

(56) Literature Cited: Unexamined Patent Application (Kokai) 63-150009 (JP, A)

Unexamined Utility Model Application 60-20735 (JP, U)

Unexamined Utility Model Application 57-157238 (JP, U)

Unexamined Utility Model Application 50-120654 (JP, U)

(54) [Title of the Invention] **Electrically powered toothbrush**

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JP 2540444

CLAIMS

(57) [Utility model registration claim]
[Claim 1] In the electric toothbrush machine which attaches a gear-tooth brush unit in the body of a vessel, connects the latter shaft with the former driving shaft, drives the former motor, moves said driving shaft, tells the motion through said shaft, and operates the latter gear-tooth brush The body attachment base attached in said body of a vessel and the gear-tooth brush attaching part holding said gear-tooth brush are prepared in said gear-tooth brush unit. While it has said shaft in said body attachment base, enabling free rotation, it has the flexible shaft which connects between said gear-tooth brushes with this shaft in said gear-tooth brush attaching part, enabling free rotation. The electric toothbrush machine which compares said gear-tooth brush attaching part in the inclined plane which inclines to the shaft orientations of a driving shaft, and comes to connect it free [rotation adjustment] to said body attachment base.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed explanation of a design]
Field of the Invention This design is attached for a gear-tooth brush unit to the body of a vessel which contains a driving means, enabling free exchange, and is related with the electric toothbrush machine which brushes teeth by making the gear-tooth brush of that gear-tooth brush unit rotate and reciprocate automatically.
Prior art Conventionally, as shown in Fig. 20, the exchangeable gear-tooth brush unit 2 is formed in the whole to the body 1 of a vessel at one, and there is a thing of a configuration of tying up much brush hair into a knot, respectively to that (the condition of having removed that gear-tooth brush unit 21 in Fig. 21 being shown) head 2a, and forming some brushes 3 according to an individual free [rotation] respectively in this kind of electric toothbrush machine. And the rotation reciprocating motion of each brush 3 is carried out, and toothbrushing by the rotary method is enabled (refer to JP,63-38408,A).
Technical problem which a design tends to solve When time brushed teeth with such a conventional electric toothbrush vessel by attaching the gear-tooth brush unit 2 in the body 1 of a vessel, there were ** and a problem that effective toothbrushing could not be performed using an electric toothbrush machine, after all that brush connection 2a cannot apply a brush 3 to single direction easily certainly like a dental background or a molar depending on a toothbrushing part to the body 1 of a vessel because of immobilization.
Then, the purpose of this design is in the electric toothbrush machine mentioned above to make it possible to apply a brush to a gear tooth certainly and easily according to a toothbrushing part, and to perform effective toothbrushing.
The means for solving a technical problem Therefore, this design For example, attach the gear-tooth brush unit 80 in the body 10 of a vessel, and the latter shaft 91 is connected with the former driving shaft 35 as the following illustration examples are shown. In the electric toothbrush machine which drives the former motor 17 moves said driving shaft 35, tells the motion through said shaft 91, and operates the latter gear-tooth brush 102 The body attachment base A attached in said body 10 of a vessel and the gear-tooth brush attaching part B holding said gear-tooth brush 102 are formed in said gear-tooth brush unit 80. While it has said shaft 91 in said body attachment base A, enabling free rotation It has the flexible shaft 92 which connects between said gear-tooth brushes 102 with this shaft 91 in said gear-tooth brush attaching part B, enabling free rotation. It is characterized by comparing said gear-tooth brush attaching part B by inclined plane 85a and 82a which inclines to the shaft orientations of a driving shaft 35, and coming to connect it free [rotation adjustment] to said body attachment base A.
operation and the time of brushing teeth with this electric toothbrush vessel -- the body 10 of a vessel -- a gear-tooth brush unit -- attaching -- after -- a toothbrushing part -- responding -- the gear-tooth brush attaching part B -- rotating -- the body attachment base A -- receiving -- suitably -- an include-angle inclination -- carrying out -- **********.
Example This design is hereafter explained to a detail with the example shown in a drawing.
Figs. 9 and 10 show the configuration of the whole internal device of the electric toothbrush machine which is one example of this design. The gear-tooth brush 11 for rolling-cum-buses is connected to the body 10 of a vessel, and this electric toothbrush machine becomes it so that it may illustrate, for example. The body 10 of a vessel is equipped with the body case 12, the upper case 13 attached in the vertical both ends, and the bottom case 14, and is equipped with an internal device in these cases. And it comes to cover the upper case 13 with

cap 15. In the body case 12, the inner case 16 is arranged and a reversible motor 17 and the charge cell 18 are contained through the inner case 16. On the other hand, it comes to prepare the charge terminal 19 in the bottom case 14.

On the motor gear 20 of a reversible motor 17, as shown in Fig. 11, a contrate gear 21 gears. A contrate gear 21 is formed in the motor shaft 22 and the support shaft 23 arranged at a right angle free [rotation in forward reverse both directions]. The support shaft 23 supports both ends with a chassis 24. And this contrate gear 21 has the eccentric projection 25, as shown in Figs. 11 and 12. The eccentric projection 25 engages with the long hole 27 which opens in a change-over coma 26. A change-over coma 26 consists of the engagement section 28 by the side of a contrate gear 21, and the disc-like fitting section 29 which has spherical external surface. Among those, as shown in the periphery of the fitting section 29 at 13th [**] Fig. (b), two pairs of engagement step 29 a.29d, and 29b and 29c are prepared in the position of symmetry on the basis of the core of a long hole 27, respectively. And this change-over coma 26 contains that fitting section 29 in a follower's 30 maintenance hole 31, as shown in Figs. 11 and 12, and that peripheral face is inserted in the inner skin of the maintenance hole 31, and it holds it free [rotation]. Moreover, the engagement section 28 is arranged in the guide square hole 33 of the fixed guidance frame 32. And this change-over coma 26 whole is pinched between a contrate gear 21 and a chassis 24, and a motion of the longitudinal direction in that drawing is regulated. A follower 30 has engagement projected part 30a and 30b which counters the inner skin of the maintenance hole 31. And a driving shaft 35 is penetrated to upper limit section 30c, and it comes to fix to this driving shaft 35. As shown in Fig. 10, the fixed guidance frame 32 has bearing 32a which really fabricates and comes on the guide square hol 33, and carries out bearing of the driving shaft 35 by the bearing 32a and the bearing 36 prepared at the method of the drawing Nakagami. And a driving shaft 35 is held focusing on the axis free [a rotation round trip] and free [straight-line reciprocation in the direction of an axis]. A deer is carried out, and as shown in Fig. 11, in that upper limit section 32b, it comes to carry out the screw stop of this fixed guidance frame 32 to the upper case 13 on both sides of both the chassis 24. And if a contrate gear 21 is now rotated clockwise among the 10th Fig. (normal rotation), based on the rotation, by the eccentric projection 25, a change-over coma 26 will be pushed and it will rotate. And as shown in 13th [**] Fig. (b), engagement step 29 a.29d is engaged with engagement projected part 30a and 30b, respectively, and let a change-over coma 26 be the 1st rotation location of illustration. And if a contrate gear 21 rotates further, it shows around by the fixed guidance frame 32, and the parallel displacement of the change-over coma 26 is carried out to the left-hand side in drawing, and it will be i the condition which shows in 13th [**] Fig. (b). After returning to a center valve position as shortly shown to (Ha) if a contrate gear 21 furthermore rotates, a parallel displacement is carried out to the drawing Nakamigi side who shows (d). After an appropriate time, it returns to the center valve position again shown in (b). By this repeat, the parallel displacement of the change-over coma 26 is carried out in the longitudinal direction in drawing of an axis, i.e., the direction of a driving shaft 35, and the right-angled direction by the stroke which corresponds the twice of the eccentricity of the eccentric projection 25. In that case, while showing around by parallel guide side 33a under drawing Nakagami of the guide square hole 33 of the fixed guidance frame 32, the motion under drawing Nakagami of a change-over coma 26 is regulated. And based on the parallel displacement of this change-over coma 26, a follower 30 is pushed through stop projected part 30a and 30b wit that change-over coma 26. Then, rotation reciprocation of the driving shaft 35 is carried out a core [the axis] through the follower 30. On the contrary, if inverse rotation of the contrate gear 21 is carried out to the counterclockwise rotation in the 10th Fig., based on the rotation, inverse rotation of the change-over coma 26 will be pushed and carried out 90 degrees by the eccentric projection 25. And as shown in (b) in the 14th Fig., shortly, engagement step 29c and 29b are engaged with an engagement projected part, respectively, and let the change-over coma 26 be the above-mentioned 1st rotation location and the right-angled 2nd rotation location of illustration. And if a contrate gear 21 carries out inverse rotation further, it shows around by the fixed guidance frame 32, and the parallel displacement of the change-over coma 26 is carried out to a drawing Nakagami side, and it will be in the condition which shows in ** 14th Fig. (b). After returning to a center valve position as shortly shown to (Ha) if a contrate gear 21 furthermore carries out inverse rotation, a parallel displacement is carried out to the drawing Nakashita side who shows (d). After an appropriate time, it returns to the center valve position again shown in (b). By this repeat, the parallel displacement of the change-over coma 26 is carried out to drawing Nakagami down, i.e., the shaft orientations of a driving shaft 35, by the stroke which corresponds

the twice of the eccentricity of the same eccentric projection 25. In that case, while showing around by parallel guide side 33b of right and left of the guide square hole 33 of the fixed guidance frame 32 among drawing, the movement toward right and left of a change-over coma 26 among drawing is regulated. And based on the parallel displacement of this change-over coma 26, a follower 30 is pushed through engagement projected part 30a and 30b with that change-over coma 26. Then, straight-line reciprocation of the driving shaft 35 is carried out in the direction of an axis through the follower 30.

Moreover, as shown in Fig. 15 in detail, motor base housing 40 and a battery holder 41 are fabricated to one, and said inner case 16 becomes, and has the motor receipt opening 42 and the cell receipt opening 43 which are opened to the reverse sense at ** at each. Among those, as shown in Fig. 16, the L-like insulator 44 is attached to the reversible motor 17 contained in motor base housing 40. The insulator 44 comes to solder the motor terminal 46-47 linked to the lead terminal of a reversible motor 17 to the piece 45. The contact spring 48-49 wa formed in one motor terminal 46 by press working of sheet metal at one, and the contact spring 50 is formed in the motor terminal 47 of another side by press working of sheet metal at one. And these between is insulated on both sides of electric insulating plate section 45a prepared in the piece 45 of an insulator 44 with those motor terminals 46-47, and while holding one contact spring 48-49 by contact spring attaching part 51a and 51b prepared in the other pieces 51, the contact spring 50 of another side is held by contact spring attaching part 51c. A deer is carried out and these contact spring 48-49-50 is lengthened in parallel with the method of drawing Nakagami. And it comes to contain a reversible motor 17 in motor base housing 40, where some motor receipt openings 42 are covered for the piece 45 of this insulator 44 by the other pieces 51 with ********** at the drawing Nakashita edge of motor base housing 40. A deer is carried out, and as shown in Fig. 10, the screw stop of the reversible motor 17 is carried out to the upper limit section of the inner case 16 through a chassis 24, and it becomes. Furthermore, as shown in Fig. 15, the inner case 16 bends the power-source spring 53-54, attaches it to peripheral face 41a of a battery holder 41, and is held by two or more maintenance pawls 55. These power-sources spring 53-54 comes to lengthen its upper limit section 53a and 54a to the drawing Nakagami sense in parallel mutually. And it holds by 51d of power-source spring attaching parts, and 51e prepared in the other pieces 51 of the insulator 44 shown in Fig. 16, and as shown in Fig. 10, upper limit section 53a and 54a of the power-source spring 53-54 are arranged between the contact spring 48-50 and the contact spring 50.49, respectively, and it becomes. And further, as shown in Fig. 15, it comes to connect with the power-source spring 53-54 with soldering the cell terminal 57-57 which projects, respectively from the hole 56-56 made in the power-source stowage 41. A deer is carried out, and as shown in Fig. 10, lower limit section 53b and 54b of the power-source spring 53-54 are connected with the charge terminal 19 in the bottom case 14, and it becomes. In addition, it is the diode for antisuckbacks at the time of short [between said charge terminals 19] which is shown with the sign 58 in the 15th Fig.

Furthermore, as shown in Figs. 17 and 18, the guide plate section 60 is formed in the periphery (9th [**] Fig. Nakagami edge periphery) of the body case 12, guide length slot 61a is opened in the both sides, and engagement round hole 61b is opened in the center. And the cylinder-like switch cam 63 is engaged with the engagement round hole 61b through O ring 62, and it supports free [rotation]. The switch cam 63 has the engagement projection 64-65 in the periphery of the right-and-left end face, respectively. Hook pawl 66a which projects in the inner sense is engaged with the both-sides section of the slide plate 66 at guide length slot 61a. And sliding of the vertical direction of the slide plate 66 is enabled on the body case 12. The slide plate 66 has the engagement length slot 67 opened crosswise in the center section. And the engagement projection 64 on the left-hand side of [in drawing] the switch cam 63 is engaged with the engagement length slot 67. A deer is carried out, it slides on the slide plate 66, and the switch cam 63 is rotated. The engagement projection 65 by th side of drawing Nakamigi of the switch cam 63 engages with the long hole 69 of a switch lever 68. As shown in Fig. 19, the switch lever 68 opens the regulation hole 70 in the upper limit section 68a with a long hole 69, and forms the spring retention groove 71-72 in lower limit section 68b. In the spring retention groove 71-72, as shown in Fig. 10, it is engaged and upper limit section 53a and 54a of the cell spring 53-54 are held. And as shown in Fig. 11, it is attached in a chassis 24 for this switch lever 68 rockable as the supporting point by the pin 73. As a deer is carried out and it is shown in Fig. 19, tip 23a of the support shaft 23 of a minor diameter is inserted in the regulation hole 70 from it, and the rocking include-angle range of a switch lever 68 is regulated. Moreover, the click spring 75 is attached in tip 23a of the support shaft 23. The click spring 75 is hung on notch

63a which prepares hook section 75b in the periphery of the switch cam 63 while it engages with engagement step 68c of a shift lever 68 by the engagement crevice 75a. And if the click spring 75 is resisted and the switch cam 63 is rotated with the slide plate 66, it will consider as the configuration to which a feeling of a click is given. A deer is carried out, for example, about the slide plate 66, as it is indicated in Fig. 10 as **********, a switch lever 68 is in the mid-position on the body case 12 in a straight center valve position, and it will be in the condition of power-source OFF. And if it slides, for example on a slide plate and positioning and the switch cam 63 are rotated in the upper part location of the body case 12 Rotate the switch cam 63 to an one direction, rock a switch lever 68 to 10th [**] Fig. Nakamigi side, and upper limit section 53a and 54a of the power-source spring 53-54 are sagged on right-hand side. While carrying out a contact flow with one upper limit section 53a and the contact spring 50, the contact flow of the upper limit section 54a of another side is carried out with the contact spring 49, a power source is turned on, and a reversible motor 17 is driven. moreover, it is alike in if a switch lever 68 will be rocked on the left-hand side in the 10th Fig., upper-limit section 53a and 54a of the power-source spring 53-54 will be sagged on left-hand side, if the slide plate 66 is rotated in a lower part location and positioning and the switch cam 63 are rotated in the other directions, and one upper-limit section 53a carries out a contact flow with the contact spring 48 shortly, and upper-limit section 54a of another side carries out a contact flow with the contact spring 50, and reverse-drives a reversible motor 17.

Moreover, as shown in Figs. 9 and 10, said driving shaft 35 makes tip 35a plate-like, and comes to prepare periphery slot 35b in the periphery near [the] the tip. And hook section 11a which is engaged and prepares tip 35a of this driving shaft 35 and the lower limit section of the gear-tooth brush 11 for rolling-cum-buses in that lower limit section is hung on periphery slot 35b, is stopped, and it comes to connect this gear-tooth brush 11 for rolling-cum-buses with a driving shaft 35 free [removal].

On the other hand, the gear-tooth brush unit 80 for rotaries linked to this same driving shaft 35 (gear-tooth brus unit) consists of a configuration as shown in Figs. 1 and 2 . This gear-tooth brush unit 80 for rotaries consists of a body attachment base A equipped with an internal device in the unit case 81, and a gear-tooth brush attaching part B equipped with an internal device in the head case 82. And as shown also in Fig. 3 , it engages with engagement crevice 15a which prepares engagement heights 81b of the side else in cap 15, and comes to hold the gear-tooth brush unit 80 for rotaries, while hanging hook section 81a prepared in the drawing Nakashita [Masakazu] side of the unit case 81 on hanging crevice 13a prepared in the upper case 13 of the body 10 of a vessel and stopping it, as shown in Fig. 1 free [exchange] to the body 10 of a vessel. The unit case 81 opens in upper limit the connection opening 83 of which an include-angle alpha inclination is done to the connection direction with the head case 82, as shown in Fig. 1 and 4th [**] Fig. (b). And it comes to fix the bearing pipe 84 to up inner circumference. As shown in Fig. 5 , the bearing pipe 84 opens spacing in inclined plane 85a which it has on the shoulder 85, prepares positioning crevice 85b in the position of symmetry, respectively, and prepares flange 86a in the upper limb of the minor diameter neck 86. And inclined plane 85a and a neck 86 are made to be the same as that of the connection opening 83 an include-angle alpha inclination, and as shown in Fig. 6 , they project and form a neck 86 from connection opening. A deer is carried out and the head case 82 is connected with a neck 86. As shown in Figs. 5 and 6 , it carries out by breaking the two connection sections 87, and the head case 82 becomes, and has inclined plane 82a of which an include-angle alpha inclination is done at the lower limit side. Heights 87a is prepared in the position of symmetry on the inclined plane 82a by positioning. Moreover, it comes to prepare guide section 87b in inner circumference. And this connection section 87 is pushed open, that opening 87c is fitted into the neck 86 of the bearing pipe 84, positioning heights 87a is engaged with positioning crevice 85a, inclined plane 85a and 82a are compared mutually, and the gear-tooth brush attaching part B is connected with a serial in the body attachment base A. A deer is carried out, and as it rotates 180 degrees from the erection condition which shows the gear-tooth brush attaching part B by 4th [**] Fig. (b) and (b) shows **********, include-angle adjustment in the condition that only include-angle 2alpha inclined in the drawing Nakashita sense to the body attachment base A is enabled.

Moreover, in the unit case 81, the joint member 88 is arranged and this gear-tooth brush unit 80 for rotaries comes, as shown in Fig. 1 . The joint member 88 consists of a shaft supporter 90 of a minor diameter from a body 89 and it, as shown in Figs. 1 and 7 . A body 89 prepares slit 89a in the position of symmetry, and prepares hanging projected part 89b of the inner sense in a lower limit. And hanging projected part 89b is hung on periphery slot 35b of a driving shaft 35, is stopped, and it comes to connect with the driving shaft 35.

Furthermore, this joint member 88 comes to carry out insert molding of the shaft 91 to that shaft supporter 90. The shaft 91 comes to form spherical section 91a in the middle. And a motion of a shaft 91 is guided in the bearing pipe 84 through the spherical section 91a. And it comes further to fix the flexible shaft 92 which consists of a compression spring at the tip of a shaft 90. As shown in Figs. 6 and 8 , a flexible shaft 92 lengthens tip 92a in the head case 82, and attaches a shift lever 93 in the tip 92a. A shift lever 93 consists of an attaching part 94 holding a flexible shaft 92, and tabular cam Itabe 95, and enables sliding of the bottom of drawing Nakagami among guide section 87b of the head case 82. Cam Itabe 95 comes to stand the engagement pin 96 while preparing engagement crevice 95a of straight side in the shaft orientations of a flexible shaft 92. And the gearing shaft 98 of a sector gear 97 is engaged with engagement crevice 95a, and the engagement pin 96 is engaged with engagement crevice 97a of a sector gear 97. The gearing shaft 98 supports the both ends in the head case 82. A sector gear 97 meshes with the pinion 99 with few [a radius is small and] numbers of teeth than it. It comes to attach a pinion 99 in the head case 82 free [rotation reciprocation] through the support shaft 100. And if straight-line reciprocation of the shift lever 93 is carried out with a flexible shaft 92, for example by 3mm small stroke, by the shift lever 93, a sector gear 97 is pushed through the joint pin 96, rotation reciprocation is carried out in [include-angle] 60 degrees, it will accelerate 3 times with the sector gear 97 further, and rotation reciprocation of the pinion 99 will be carried out in [include-angle] 180 degrees. A deer is carried out, and as shown in Fig. 1 , rotation reciprocation of the gear-tooth brush 102 for rotaries attached at the tip of the support shaft 100 of a pinion 99 through an attachment component 101 is carried out with a pinion 99 a core [the support shaft 100]. In addition, the gear-tooth brush 102 for rotaries forms the tip in the shape of a cone, and makes one point the configuration which can be polished intensively.

Now, when brushing teeth using the electric toothbrush machine of a configuration of having mentioned above, first, according to a toothbrushing part and its purpose, it chooses suitably, and either the gear-tooth brush 11 for rolling-cum-buses or the gear-tooth brush unit 80 for rotaries is connected to the body 10 of a vessel.

And when brushing teeth by now, for example, a rolling method, power-source ON of the slide plate 66 is carried out in the upper part location of the body case 12, and a reversible motor 17 is driven. A contrate gear 2 is rotated (normal rotation), a deer is carried out, engagement step 29 a.29d of a change-over coma 26 is engaged with a follower's 30 engagement projected part 30a and 30b, a change-over coma 26 is made into the 1st rotation location, it shows around by the fixed guidance frame 32, and rotation reciprocation is carried out with a driving shaft 35 through a follower 30. A deer is carried out and the gear-tooth brush 11 performs toothbrushing by the rolling method.

Moreover, when brushing teeth by the bus method, the slide plate 66 is made into the lower part location of the body case 12, and a reversible motor 17 is reverse-driven. A deer is carried out, inverse rotation of the contrate gear 21 is carried out, a change-over coma 26 is rotated, shortly, it engages with a follower's 30 engagement projected part 30a and 30b, and engagement step 29c and 29b are made into the 2nd rotation location, is guided by the fixed guidance frame 32, and straight-line reciprocation is carried out with a driving shaft 35 through a follower 30. A deer is carried out and the gear-tooth brush 11 performs toothbrushing by the bus method.

Next, when brushing teeth by the rotary method, after connection of the gear-tooth brush unit 80 for rotaries, according to toothbrushing parts, such as a dental background and a molar, the gear-tooth brush unit 80 for rotaries is suitably rotated to the body 10 of a vessel, and a location is adjusted whenever [angle-of-inclination]. Like the case where carry out a deer and it is based on the bus method the back, the slide plate 66 is made into the lower part location of the body case 12, and a reversible motor 17 is reverse-driven. And straight-line reciprocation of the driving shaft 35 is carried out with a shift lever 93, rotation reciprocation of the sector gear 97 is carried out by the shift lever 93, and rotation reciprocation of the pinion 99 is carried out with the sector gear 97. A deer is carried out, rotation reciprocation of the gear-tooth brush 102 for rotaries is carried out with a pinion 99, and toothbrushing by the rotary method is performed. In addition, in the example mentioned above, even if it receives reaction force when brushing teeth by leaning the head case 82 since the unit case 81 is considered as the configuration which compares mutually inclined plane 85a and 82a of the head case 81 and the head case 82, there is an advantage from which whenever [tilt-angle / which was once set up] does not shift.

Therefore, the electric toothbrush machine in this illustration example can perform alternatively three kinds of toothbrushing, a rolling method, the bus method, and the rotary method.

Effectiveness of a design Therefore, according to this design, a gear-tooth brush unit is constituted from a body attachment base and a gear-tooth brush attaching part, and it makes it possible to apply a brush there certainly and easily and to perform effective toothbrushing, even if a toothbrushing part is a dental background, a dental molar, etc., since a gear-tooth brush attaching part is considered for whenever [that angle-of-inclination] as the configuration which connects possible [adjustment] to that body attachment base.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
The sectional view in which Fig.'s 1 being an electric toothbrush machine which is one example of the design, and showing the condition of having connected the gear-tooth brush unit for rotaries to the body of a vessel, Th sectional view where Fig. 2 saw it from left-hand side, the rear view showing [3] the connection structure to the body of a vessel of the gear-tooth brush unit for rotaries, A condition explanatory view when 4th [**] Fig. (b) (b) changes the positioning include angle of the gear-tooth brush unit head for rotaries, The sectional view i which Fig.'s 5 showing the perspective view with a group of the head case to a bearing pipe, and showing [6] the structure within the head case of the gear-tooth brush unit for rotaries, The perspective view in the condition that Fig. 7 attached the joint member, the shaft, and the flexible shaft in one, The sectional view which saw the inside of the head case of the gear-tooth brush unit for rotaries which shows Fig. 8 in Fig. 6 from left-hand side, The sectional view showing the internal device of this whole electric toothbrush machine in which Fig. 9 connected the gear-tooth brush for rolling-cum-buses to the body of a vessel, The sectional view where Fig. 10 looked at it from left-hand side, the partial enlarged drawing of the electric toothbrush machine which shows Fig. 11 in Fig. 9 , The actuation explanatory view showing [12] gradually the parallel displacement of a change-over coma when the decomposition perspective view of the movement translator of this electric toothbrush machine, 13th [**] Fig. (b) - (d) rotate a contrate gear clockwise, The actuation explanatory view showing gradually the parallel displacement of a change-over coma when ** 14th Fig. (b) - (d) rotate a contrate gear counterclockwise, The perspective view of the inner case in which Fig. 15 attached the power-source spring, and Fig. 16 The decomposition perspective view of an insulator and a motor terminal, Fig. 17 is a decomposition perspective view of the switch lever to which the slide plate and the perspective view with a group to the body case of a switch cam, and Fig. 18 abbreviated the fragmentary sectional view of these slide plate and this electric toothbrush machine in the attach point of a switch cam, and Fig. 19 abbreviated the switc cam, the click spring, and the part. The front view showing the electric toothbrush machine of the former [Fig. / 20] and Fig. 21 are front views in the condition of having removed the gear-tooth brush unit of the electric ****.
10 [.. A gear-tooth brush, A / .. A body attachment base, B / .. Gear-tooth brush attaching part.] .... The body o a vessel, 80 .. The gear-tooth brush unit for rotaries (gear-tooth brush unit), 82aand85a .. An inclined plane, 102

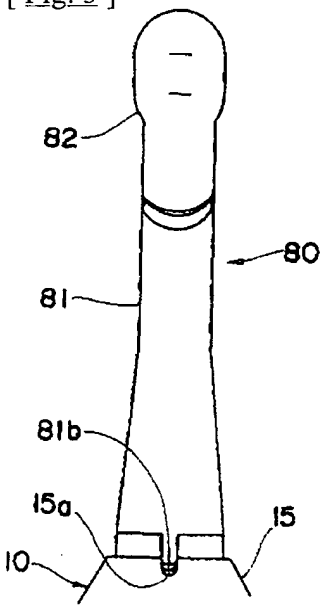
[Translation done.]

* NOTICES *

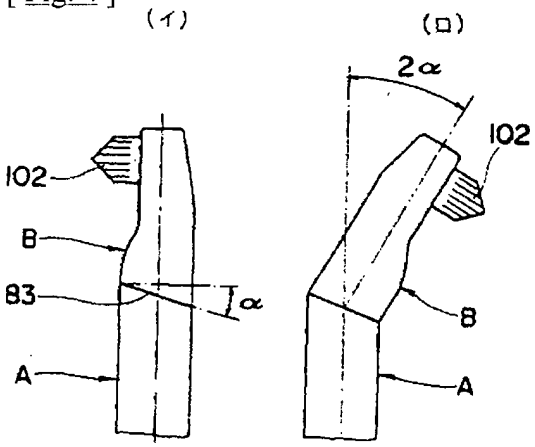
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

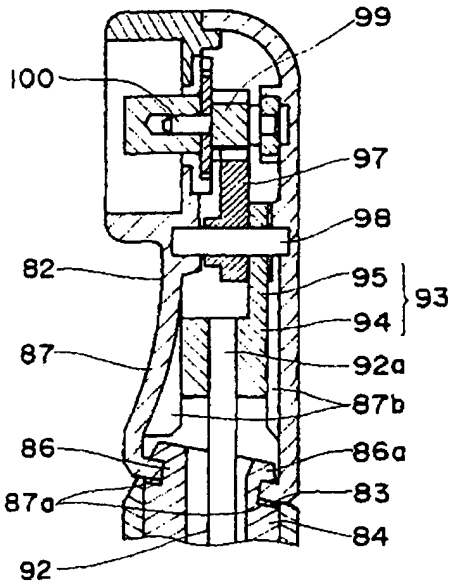
[Fig. 3]



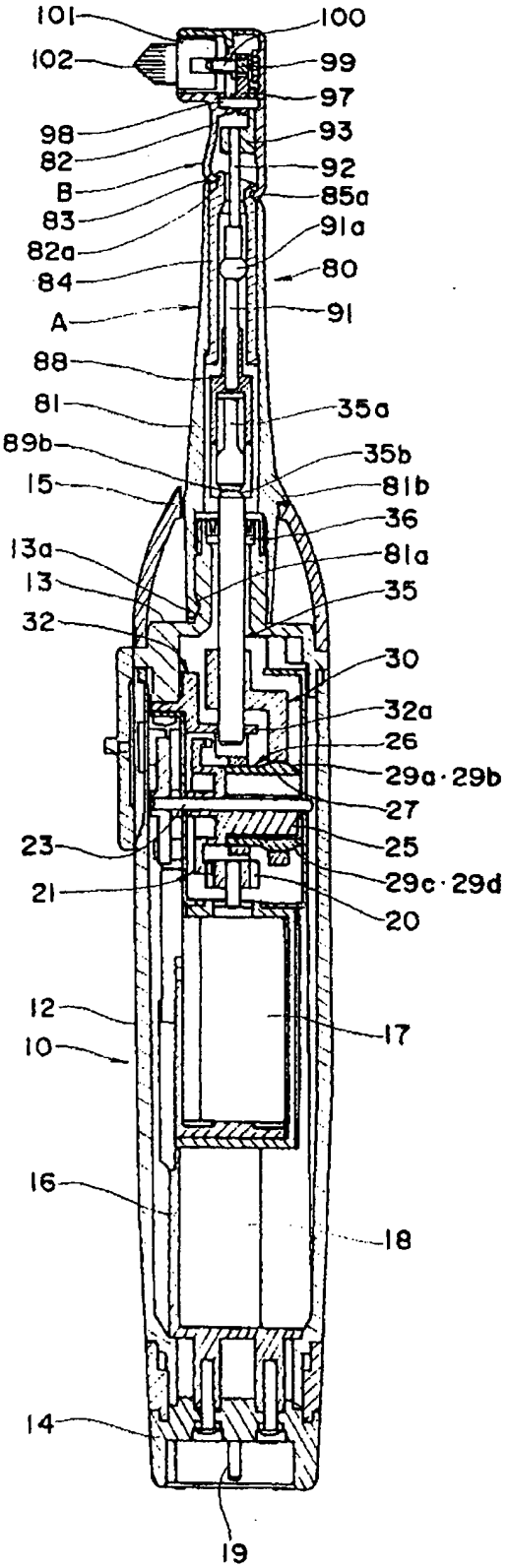
[Fig. 4]



[Fig. 6]



[Fig. 1]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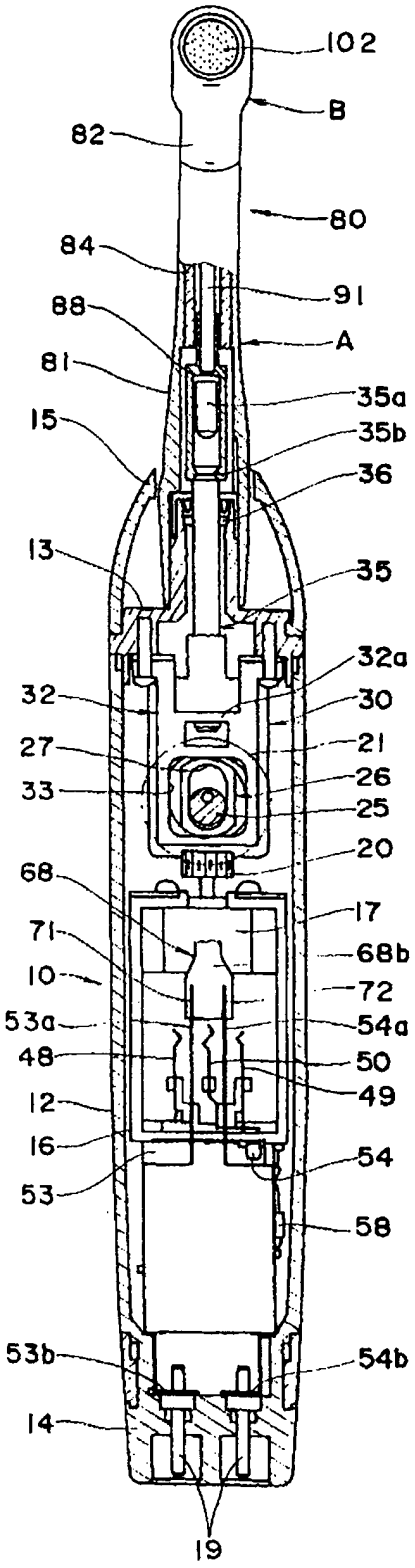
[Fig. 2]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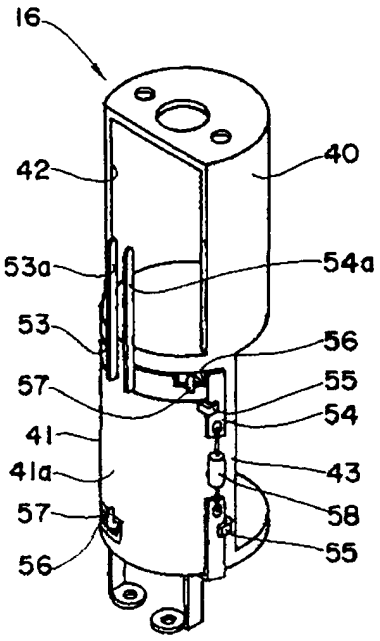
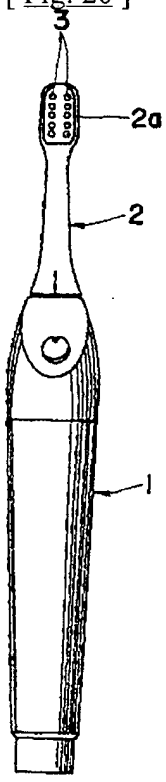
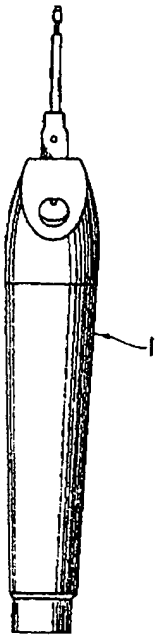
[Fig. 15]



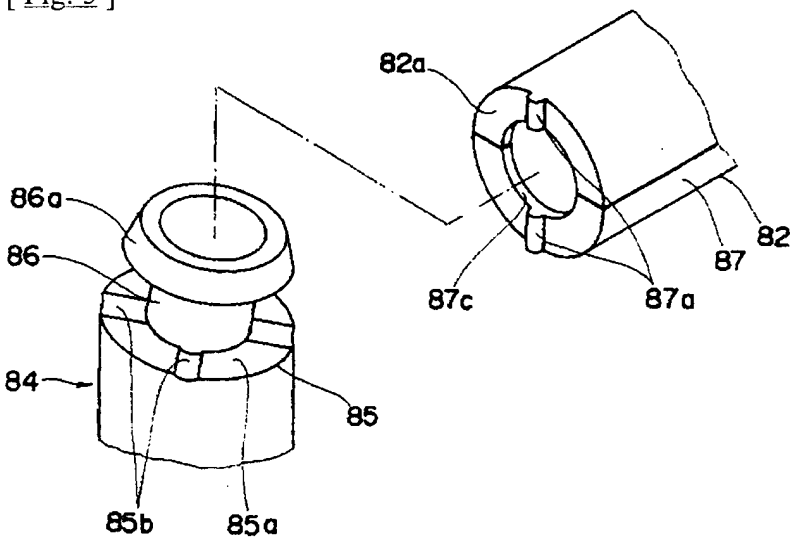
[Fig. 20]



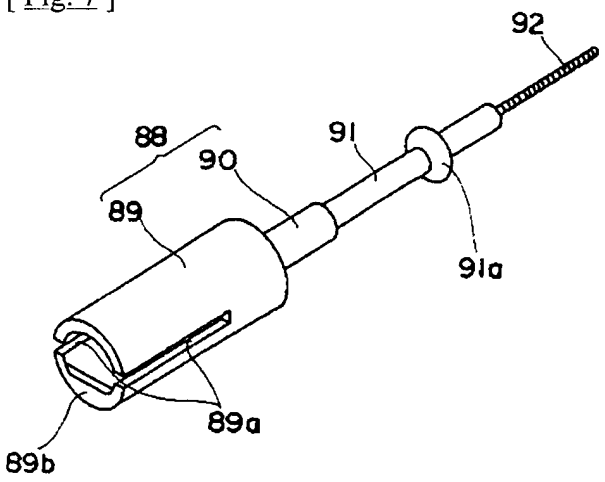
[Fig. 21]



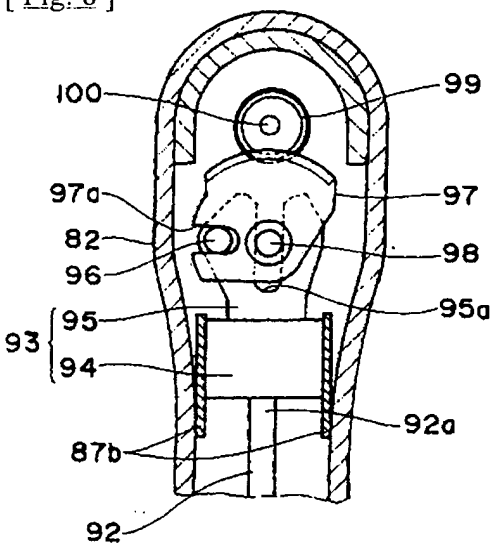
[Fig. 5]



[Fig. 7]



[Fig. 8]



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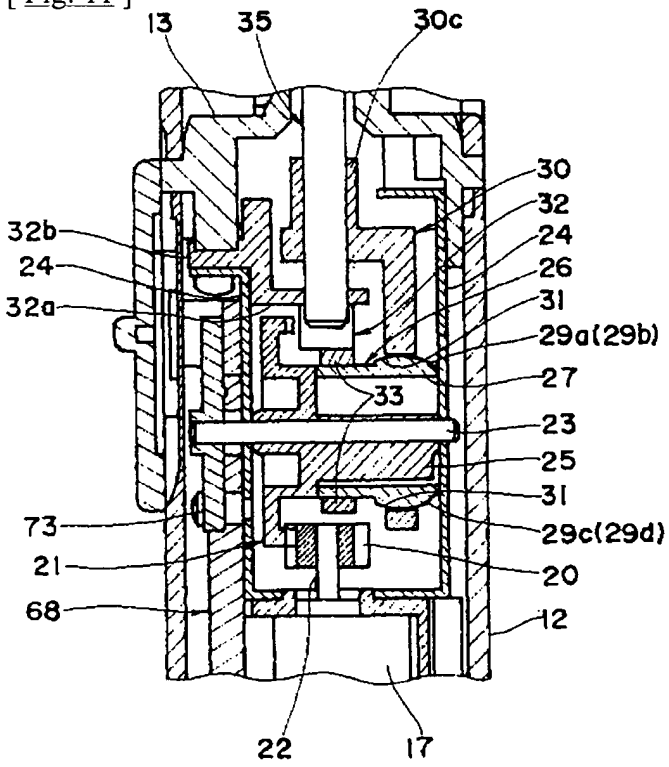
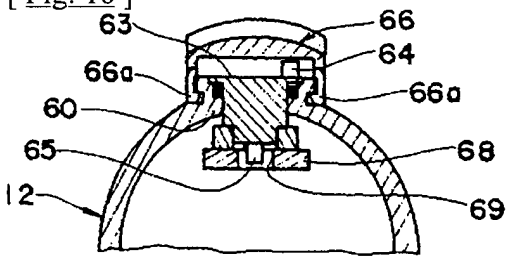
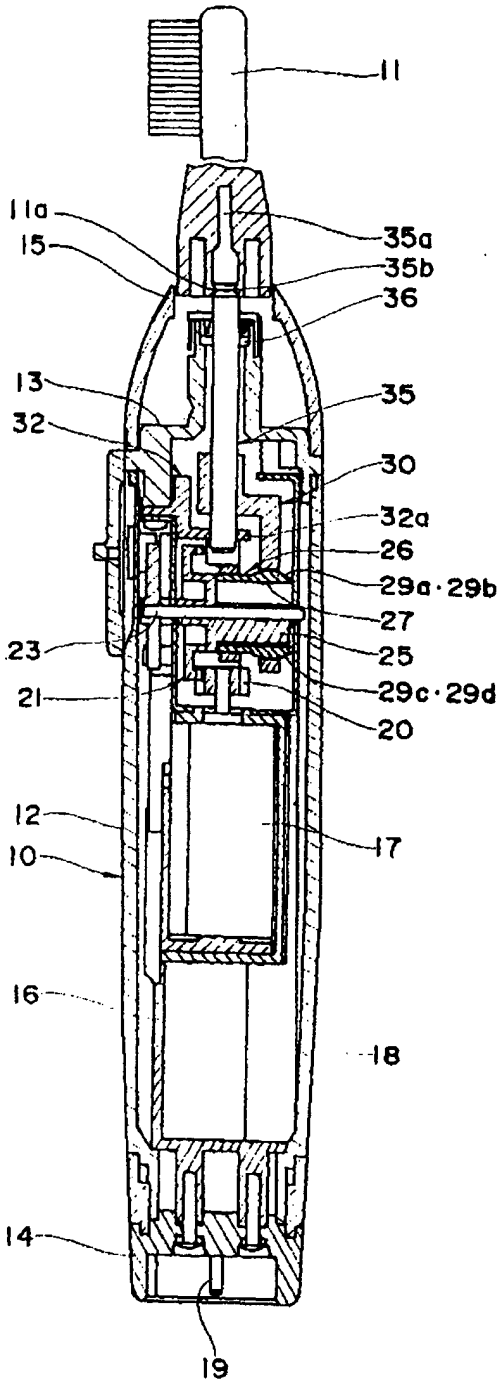


[Fig. 18]



[Fig. 9]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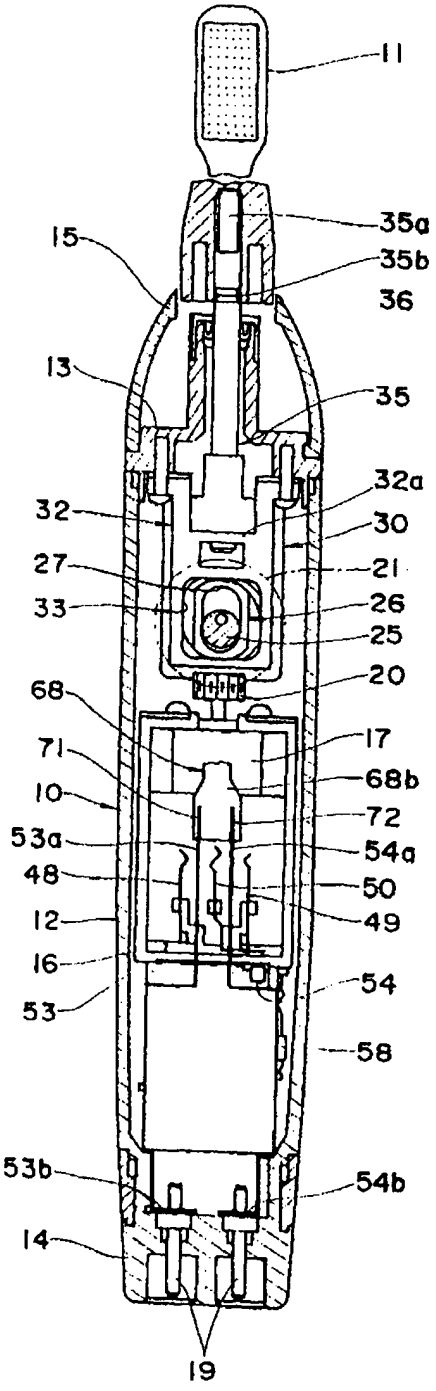
[Fig. 10]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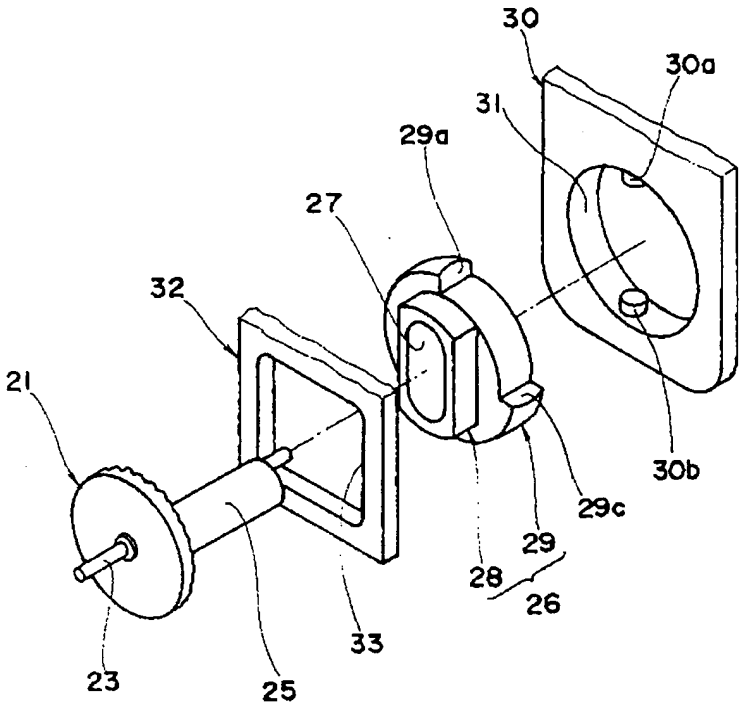
[Fig. 12]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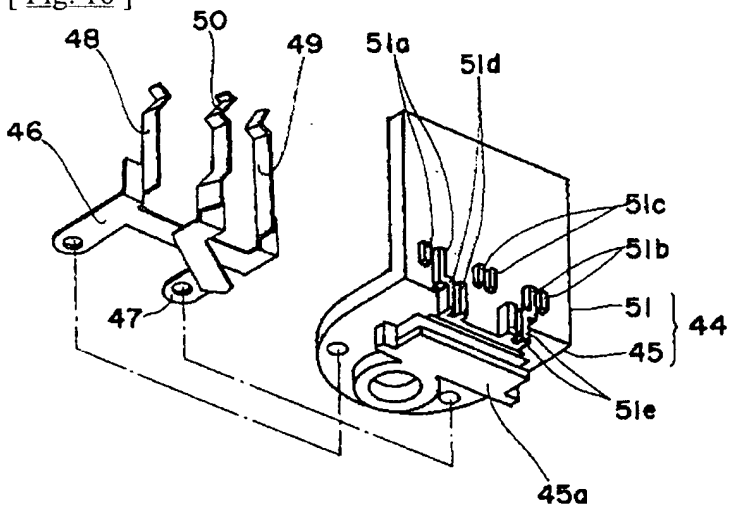
[Fig. 16]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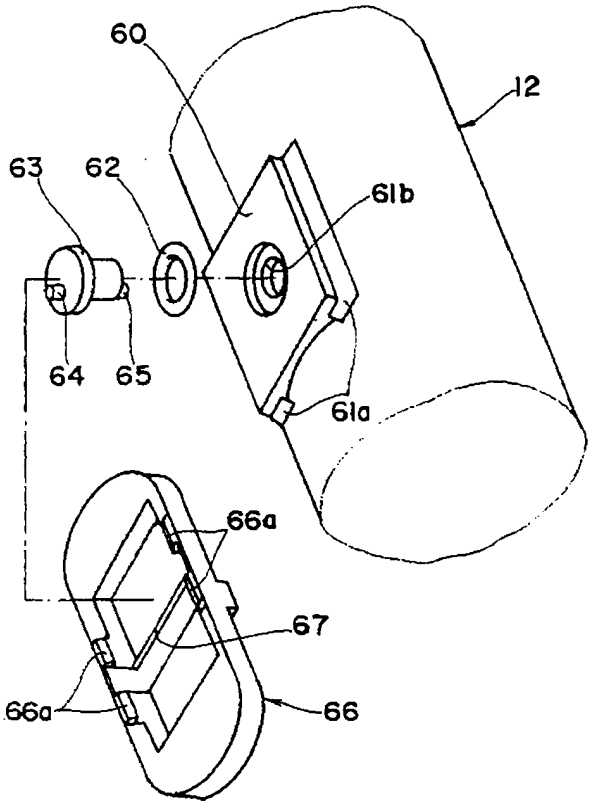
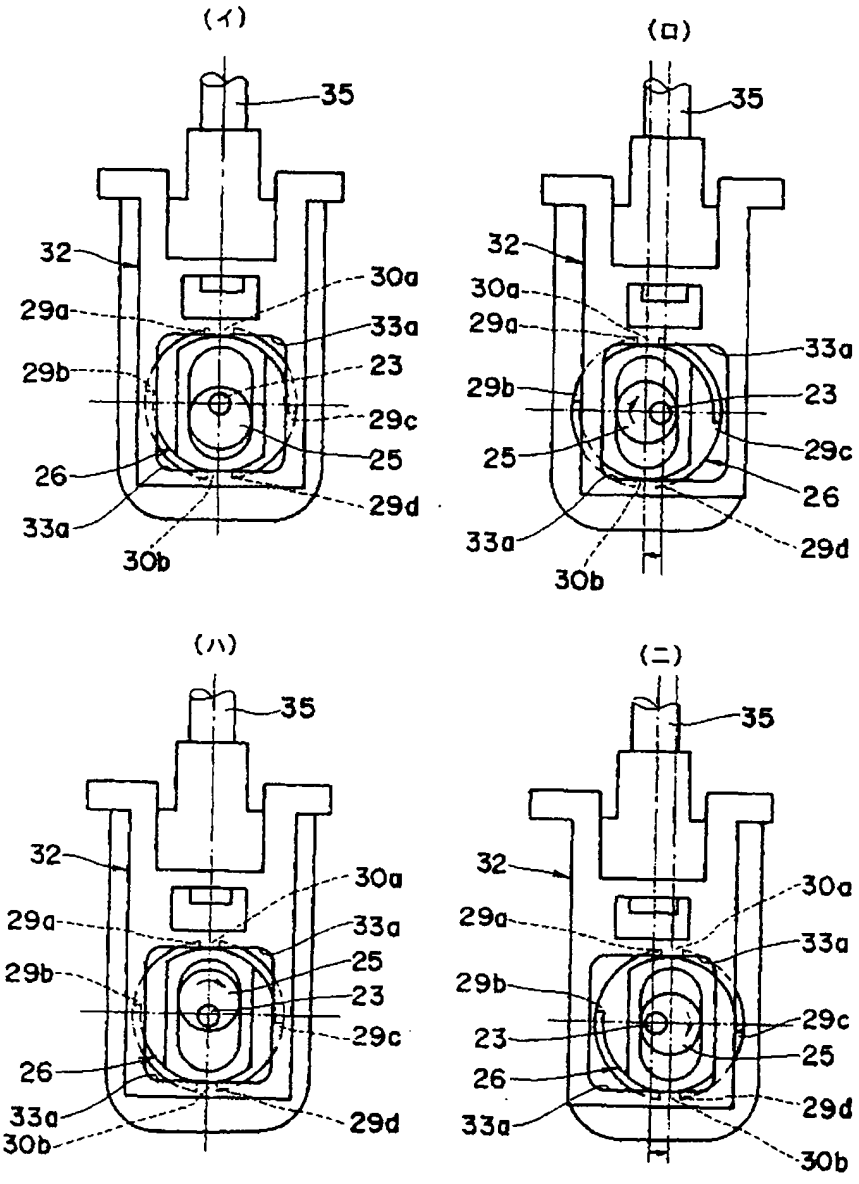
[Fig. 17]



[Fig. 13]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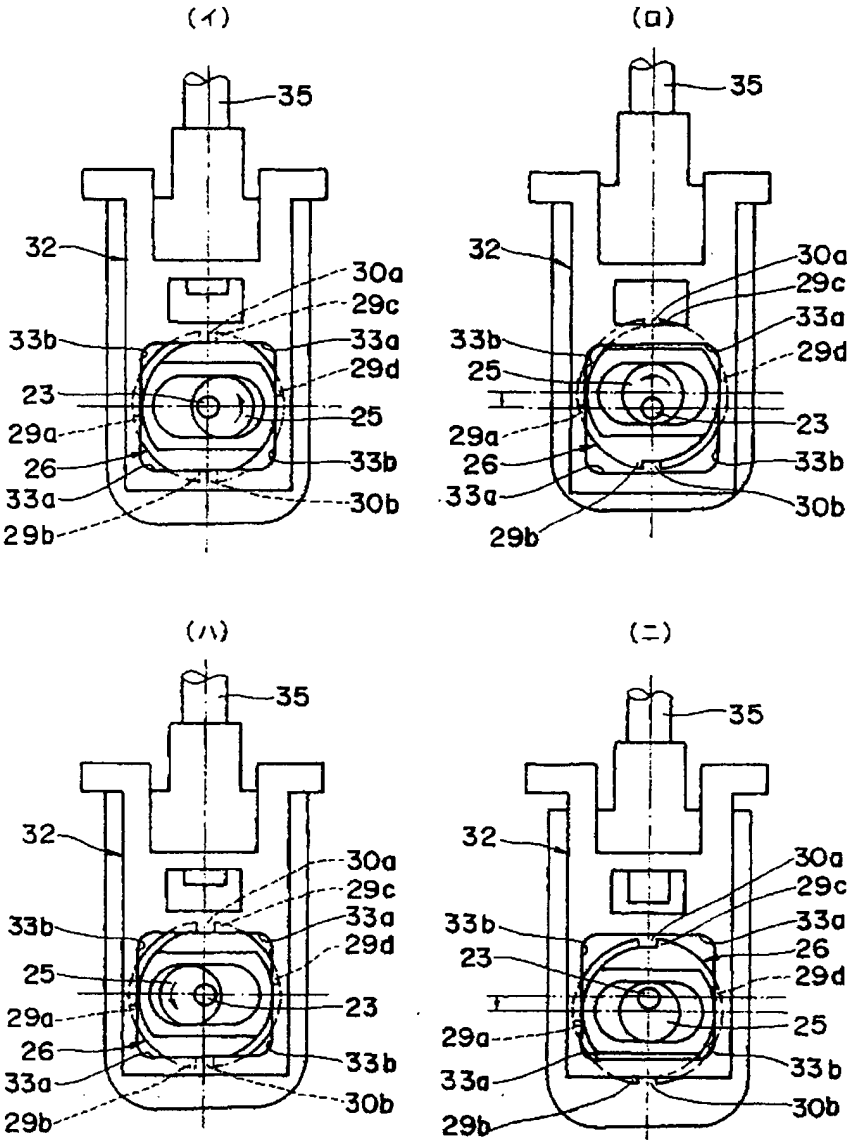
[Fig. 14]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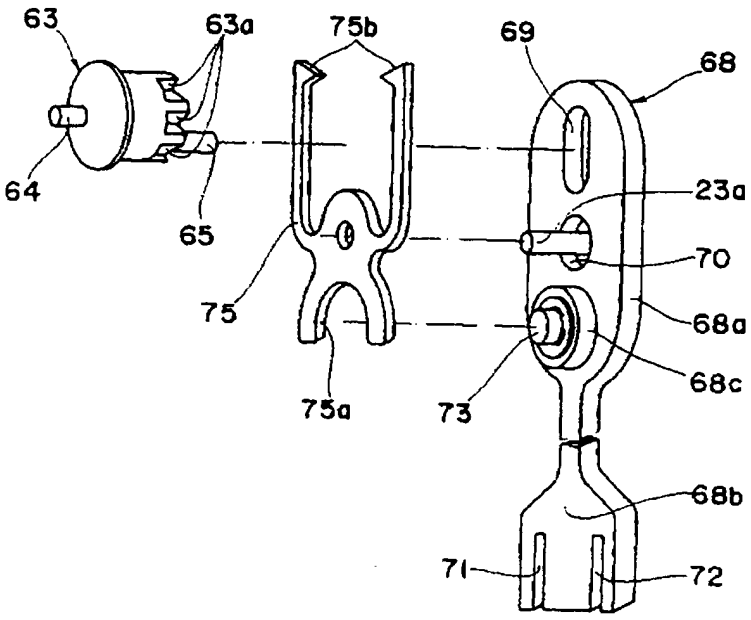
[Fig. 19]



[Translation done.]